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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/540,550

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Shinichi Kobayashi

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EXAMINER

SCHIRO, RYAN RAYMOND

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/540,550	Applicant(s) KOBAYASHI ET AL.	
	Examiner RYAN SCHIRO	Art Unit 1711	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-13,15-20 and 23-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-13,15-20 and 23-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/12/2010 and 4/14/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Claims 1, 3-13, 15-20 and 23-27 are pending and presented for examination.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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3. Claims 1, 3-8, 11-13, and 15-20 and 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (US 6632776) in view of Snitchler et al. (US 6393690).

4. Kobayashi teaches a method of preparing an oxide superconducting wire comprising the steps of preparing a wire by coating raw material powder of an oxide superconductor with a metal and heat treating the wire in a pressurized atmosphere containing oxygen where the total pressure is at least 0.5 MPa, as required by claim 1, 11, 13 and 19 (abstract). The total pressure of the pressurized atmosphere is up to 20 MPa, as required by claims 1, 11, 13 and 19 (col. 8, lines 11-12). It is understood that the critical current of the wire is improved as the total pressure of the pressurizing atmosphere is increased (col. 8, lines 52-54). The raw material powder of the oxide superconductor includes a Bi2223 phase, as required by claims 5 and 17 (col. 5, lines 32-33). The metal used to coat the oxide superconductor filaments is a silver or silver alloy, as required by claims 11 and 19 (col. 6, lines 8-10). The oxygen partial pressure of the heat treatment step is at least 0.003 MPa and less than 0.02 MPa, as required by claims 4 and 16 (col. 6, lines 33-35).

5. Kobayashi does not teach the requirements of starting pressurization from a temperature reducing the 0.2% yield strength of the metal below the total pressure at a heat-up time before the heat treatment, which is effectively a temperature from 400 to 800 degrees Celsius, as required by claims 1 and 13.

6. Snitchler teaches a process of manufacturing a multifilamentary superconducting wire (abstract). Each filament may be covered with insulating layers, which can be a variety of ceramic materials, then bundled inside of a silver jacket, as required by claim 8 (col. 16, lines 39-65). The wire can be twisted before a heat treatment, as required by claim 6 (col. 16, lines 30-

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35). An example of Snitchler teaches ramping up the temperature to 450 C at 10 C/minute and then to 500 C at 2 C/minute and given a high pressure oxidation treatment at 500 C and 100 atm, which is roughly 10 MPa, as required by claims 1, 6, 11, 13 and 19 (col. 15, lines 57-60).

Another final heat treatment is performed at 830 and 787 C, as required by claims 12 and 20 (col. 15, lines 37-40). Figure 4 shows a schematic diagram of a separate preliminary heat treatment followed by thermomechanical, or pressure and temperature, activation (col. 12, lines 40-42).

Snitchler teaches that a preliminary heat treatment is preformed until the metal predecessor layers are essentially passivated by thorough oxidation of the interface between the superconductor material and the metal layers, which is essentially the same as reducing the strength of the metal layer before applying a pressure treatment, as required by claims 1 and 13 (col. 12, lines 10-27).

7. Kobayashi in view of Snitchler does not teach the specific requirement of starting pressurization from a temperature reducing the 0.2% yield strength of the metal below the total pressure at a heat-up time before the heat treatment, as required by claims 1 and 13. However, it is inherent that a temper starting temperature of 400-800 degrees Celsius is the temperature reducing 0.2% yield strength of silver, which is the preferred metal, used for the outside jacket of the wire in both Kobayashi and Snitchler.

8. It would have been obvious to a person ordinarily skilled in the art at the time of the invention to combine the teachings of forming an oxide superconducting wire by heat treating the wire in a pressurized atmosphere with starting pressurization from a temperature between 400 to 800 degrees Celsius, as required by claims 1, 13. One would have been motivated to make this modification because Snitchler shows that a higher temperature and lower pressure provide

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quicker oxidation of the superconducting oxide material, which is an improvement over a high temperature and high pressure application in Figure 3 of Snitchler, which is similar to the process taught by Kobayoshi.

9. It would have been obvious to a person ordinarily skilled in the art at the time of the invention to modify the teachings of Kobayoshi in view of Snitchler to make the speed of pressurization at least 0.05 or 0.1 MPa/minute, to reach a pressure of about 50MPa and to maintain the pressure of the atmosphere higher than the pressure inside of the wire, as required by claims 1, 3, 11, 13, 15, 19, 25 and 27. One would have been motivated to make this modification because increasing the pressure at a slower rate than 0.05 MPa/minute would make the process take longer than it would increasing the pressure at a faster rate. It is well settled that determination of optimum values of cause effective variables such as the rate of pressure increase is within the skill of one practicing in the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

10. It is inherent that the pressurization would inhibit gas penetration in pinholes in the metal during the heat up time before heat treatment, as required by claim 26 because Kobayoshi in view of Snitchler teaches the same process as the claim 1.

11. It would have been obvious to leave out the rolling steps taught by both Kobayoshi and Snitchler, as required by claim 7, because omission of rolling would merely cause the loss of the added compression of the wire. *In re Wilson*, 153 USPQ 740.

It would have been obvious that the method for producing an oxide superconducting wire can also be a method for modifying an already formed oxide superconducting wire because the function, manner and result of modifying a wire of the same composition as the manufactured

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wire are the same, as required by claims 13-20. In general, the transposition of process steps where the process are substantially identical or equivalent in terms of function, manner and result, was held to not patentably distinguish the process. *Ex part Rubin*, 128 USPQ 440 (Bd. Pat. App. 1959).

12. It would have been obvious to a person ordinarily skilled in the art at the time of the invention to maintain the pressurization atmosphere below 10 atm (or 1MPa) before the pressurization is started from a temperature of 400-800 degrees Celsius, which would reduce the 0.2% yield strength of the metal, as required by claims 23 and 24. It would have been obvious to person ordinarily skilled in the art at the time of the invention that the pressure of a preliminary heat treating step which may be done at a fixed temperature of 400-800 degrees prior to the initiation of thermomechanical activation, or pressurization, (Snitchler col. 12, lines 40-42) can be at a pressure of 10 atm or less because it is shown by Snitchler that the heat treatment is meant to heat the wire only and does not teach that any pressure is applied during this step.

13. Neither Kobayoshi nor Snitchler teach molding of the wire into a coil before the heat treatment or that the wire is held under a decompressed atmosphere before pressurization, as required by claims 9 and 10.

14. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi in view of Snitchler further in view of Jin et al. (US 4952554).

15. Jin teaches a method of producing a metal clad superconductive oxide wire (abstract). Advantageously the wire is appropriately shaped prior to the heat treatment, for example wound into a helical coil, as required by claim 9 (abstract).

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16. It would have been obvious to a person ordinarily skilled in the art at the time of the invention to combine the molding of the wire into a coil before heat treating, as taught by Jin with the process of forming an oxide superconductor wire, as taught by Kobayoshi in view of Snitchler. One would have been motivated to make this modification of the wire before heat treating because Jin teaches that it is desirable in many cases to reduce the cross section prior to heat treating, which is also the object of twisting or rolling the wire before heat treating as taught by Kobayoshi in view of Snitchler.

17. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi in view of Snitchler further in view of Hikata et al. (US 5236891).

18. Hikata teaches a heat treatment of preparing an oxide superconductor material wire (abstract). It is recognized that performing a heat treatment under decompression will prevent damage resulting from swelling of the wire, although the critical current density is reduced by only performing heat treatment in decompression (col. 1, lines 55-65).

19. It would have been obvious to a person ordinarily skilled in the art at the time of the invention to start the heat treatment before pressurization at a decompressed state, as taught by Hikata, then to increase the pressure after a specific temperature is reached, as taught by Kobayoshi in view of Snitchler. One would have been motivated to make this modification because Kobayoshi and Hikata teach avoiding swelling of the wire and also teaches improving the critical current density.

Response to Applicant's Arguments

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Applicant's arguments filed March 16, 2010 have been fully considered but they are not persuasive.

In response to applicant's argument that Kobayashi in view of Snitchler does not teach that the pressurization is started from a temperature reducing 0.2% yield strength of said metal, Snitchler teaches making the temperature in the range of 400-800 degrees for the metal specified, which would reduce the 0.2% yield strength of the metal, and then a high pressure oxidation treatment at 100 ATM (col. 15, lines 57-60). Although reducing "0.2% yield strength" of the metal is not particularly taught as the intended use of the heat treatment, this outcome would be performed by the process mentioned in Snitchler. It is axiomatic that one who performs the steps of the known process must necessarily produce all of its advantages. Mere recitation of a newly discovered function or property, that is inherently possessed by things in the prior art does not cause a claim drawn to these things to distinguish over the prior art. *Leinoff v. Louis Milona & Sons, Inc.* 220 USPQ 845 (CAFC 1984). In this case, the newly discovered function of modifying a pressure/temperature combination is "reducing the 0.2% yield strength" and the recitation of Kobiyashi in view of Snitchler inherently possesses correct pressure/temperature combinations to have the same affect. See the argument below regarding samples 12, 13 and figure 14.

In regards to the applicant's argument that Kobiyashi in view of Snitchler does not teach the increasing of pressure at a speed of at least 0.05 MPa/min., as required by the amended claims 1, 11, 13 and 19, it is the opinion of the examiner that in the absence of a teaching of a specific speed of pressurization it is assumed that the pressure would increase with the temperature or that the pressure would be applied instantly, independent of temperature. In either

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case, the requirements of claims 1, 11, 13 and 19 are met because it is taught that the temperature may be increased at a variety of speeds, which would make the pressure speed at least 0.05MPa/min., and that the pressure may be applied instantly, which would surely exceed 0.05MPa/min.

Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections. In regards to the applicant's argument that Kobiyashi in view of Snitchler does not teach starting the pressurization from a temperature reducing 0.2% yield strength of the metal, the examiner points out that the critical current density of samples 1-13 taught by Kobayashi shows that the critical current density increases as the total pressure increases. In fact, the critical current density of samples 12 and 13 are within the same ranges as wires with 95-100% sintering density, as taught in applicant's specification Figure 14.

Conclusion

Claims 1, 3-13, 15-20 and 23-27 are rejected.

THIS ACTION IS MADE FINAL. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Schiro whose telephone number is 571-270-5345. The examiner can normally be reached on Monday-Friday from 8:30 AM to 6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached at 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ryan Schiro
Art unit 1711

/Michael Barr/
Supervisory Patent Examiner, Art Unit 1711